Introducing Chemistry with a Simple Chemical Reaction

KEY CONCEPTS/VOCABULARY (What you need to know)

- Chemistry is the science of changing things by mixing them or changing the temperature
- When we mix things, we can cause a chemical reaction
- chemistry: changing something by mixing, stirring, heating or cooling (we use chemistry all the time when we cook or bake)
- observation: something you saw, heard or noticed
- hypothesis: an educated guess as to what will happen in an experiment

QUESTION (What you want to learn and what to ask the children)

These questions should be asked in order so that children learn that a hypothesis is a guess about what will happen in the experiment. This expands their science vocabulary.

- What will happen if we squirt the vinegar onto the baking soda? What is your hypothesis or guess?

EXPERIMENT

Materials (What you need)

Sturdy cup, pipette (medicine dropper), vinegar, baking soda, red, blue and yellow food coloring, tray or cookie sheet

Teacher Prep (What to do before the children arrive)

- Pour a ½ cup of vinegar into a sturdy cup for each child
- Add red, yellow or blue food coloring to each cup
- Put a pipette in each cup

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Safety Prep (What to show or tell the children before you start)

- Tell children the materials are safe but should not be eaten or placed on skin
- Demonstrate use of pipette

Procedures (What to do)

- Spread baking powder on each tray
- Allow the children to touch it and feel the texture
- Ask the Questions and listen to their hypotheses
- Using a pipette, squirt the colored vinegar onto the tray

CONCLUSION

Results (What happened?)

- The vinegar is reacting with the baking soda to form a gas
- The gas escaped into the air
- Colors mix and form new colors

Questions to Ask

- Can you hear it? Watch it fizz.

Gas Fills the Balloon

From The Science Seed

(This should be done as a follow up to the "Introducing Chemistry" experiment)

KEY CONCEPTS/VOCABULARY (What you need to know)

- Mixing vinegar and baking soda causes a chemical reaction that creates a gas
- Gases have no shape and cannot be seen
- chemistry: changing something by mixing, stirring, heating or cooling (we use chemistry all the time when we cook or bake)
- observation: something you saw, heard or noticed
- hypothesis: an educated guess as to what will happen in an experiment

QUESTION (What you want to learn and what to ask the children)

These questions should be asked in order so that children learn that a hypothesis is a guess about what will happen in the experiment. This expands their science vocabulary.

- What will happen if we put the balloon over the bottle of vinegar, dumping the baking soda into the bottle? What is your hypothesis or guess?
- What will happen to the gas created?

EXPERIMENT

Materials (What you need)

Small (4 oz) water bottles, funnel, tablespoon, large balloons, vinegar, baking soda

Teacher Prep (What to do before the children arrive)

- Pour 1/3 cup of vinegar into a small (4 oz) plastic water bottle for each child
- Use a funnel to pour 1 tbsp of baking powder into a balloon
- Without dumping the baking soda in, stretch the end of the balloon over the lid of the bottle

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Safety Prep (What to show or tell the children before you start)

- Tell children not to pull on or remove the balloon from the water bottle

Procedures (What to do)

- Remind the children what happened when they squirted the vinegar onto the baking soda, or demonstrate this reaction if they did not do the "Introducing Chemistry" experiment
- Ask the Questions and listen to their hypotheses
- Have the children dump the contents of the balloon into the water bottle and observe the reaction

CONCLUSION

Results (What happened?)

- A chemical reaction—the vinegar reacts with the baking soda to form a gas
- The gas can't escape and fills the balloon

Gas Pops the Top

(This should be done as a follow up to the "Gas Fills the Balloon" experiment)
(For safety reasons, this is best done as a teacher demonstration)

KEY CONCEPTS/VOCABULARY (What you need to know)

- Like vinegar and baking soda, Alka-seltzer reacts with water to create a gas
- Chemical reactions create energy
- We can use chemistry to do work
- chemistry: changing something by mixing, stirring, heating or cooling (we use chemistry all the time when we cook or bake)
- energy: something that can do work
- observation: something you saw, heard or noticed
- hypothesis: an educated guess as to what will happen in an experiment

QUESTION (What you want to learn and what to ask the children)

These questions should be asked in order so that children learn that a hypothesis is a guess about what will happen in the experiment. This expands their science vocabulary.

- Remember how the gas filled the balloon? What will happen if we trap the gas in a film canister? What is your hypothesis or guess?

EXPERIMENT

Materials (What you need)

Film canisters, water, Alka-seltzer tablets

Teacher Prep (What to do before the children arrive)

- Fill a film canister halfway with water
- Break Alka-Seltzer tablets in half

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Safety Prep (What to show or tell the children before you start)

- Be sure to face the filled canister away from everyone and anything breakable once you put the lid on (it comes off with force like a champagne cork)

Procedures (What to do)

- Drop an Alka-seltzer tablet into a clear glass of water so the children can see that the reaction is similar to the vinegar/baking soda reaction
- Ask the Questions and listen to their hypotheses
- Drop ½ an Alka-Seltzer tablet into the film canister
- Quickly put the lid on and face it away from children/breakables

CONCLUSION

Results (What happened?)

- A chemical reaction—the Alka-Seltzer and water react, creating a gas
- The film canister captures the gas
- The captured gas pops the top off of the film canister